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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,102	08/10/2001	Michael Weber-Grabau	SEN-002	3815

7590 03/17/2004

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EXAMINER

ROSENBERGER, RICHARD A

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 03/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/927,102	Applicant(s) WEBER-GRABAU ET AL.	
	Examiner Richard A Rosenberger	Art Unit 2877	<i>AW</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent claim 1 sets forth that there is a “data processor analyzing the characteristic signatures of a wafer using a scattering model”; independent claim 26 has similar language; and independent claim 43 claims a “data processor capable of analyzing the characteristic optical signature of a wafer”. Independent claim 40 claims “analyzing the optical characteristic data using a scattering model ...”; independent claim 42 claims “measuring an optical characteristic of a wafer using a scattering model ...”; and independent claim 44 sets forth “analyzing the optical characteristic to obtain a measure ...”. The specification does not teach one in the art how to perform these claimed steps.

The instant disclosure, in the section “Background Art”, discusses scatterometry as known in the prior art; and discusses broadly that the use to

measure the features on a wafer. The specification mentions as part the background art the use of models (page 4, line 28 et seqq.).

As part of the disclosure of the invention there are general statements as to the data processing, such as “[a]nalysis of the data obtained from the light detector preferably involves comparison of the measured characteristic optical signatures from the wafer surface features with a database of signatures stored in memory...”, (page 10, line 37 through page 11, line 2). However, there is no disclosure as to how such an analysis is to take place, how these “optical signatures” are to be obtained, how the “comparison” can be used to obtain “measured characteristics”, or other practical techniques needed to actually make and use, as a part of s process of a tool, what is claimed

In preparing the previous Office action, the examiner took the background art scatterometry discussion as an acknowledgement that these techniques were substantially in the prior art, so that those in the art could, using only what they already knew about scatterometry and the techniques of making measurements using scatterometry, make and use the invention without undue experimentation. What was taken as an acknowledgement of prior art was explicitly included in the statement of the rejection.

In the remarks filed 7 December 2003 it is explicitly argued that “there is no teaching or suggestion of how a data processor of a wafer process tool can be used to analyze the characteristic signatures of a wafer using a scattering model for a

process of the tool". This is, of course, the "teaching or suggestion" that the acknowledged prior art was cited to provide. Thus the remarks *deny* that the known techniques in acknowledge prior art are sufficient to teach those in the art to make and use the invention as claimed as to the processing and analysis of the data from the wafer. However, the disclosure does not adequately teach those in the art how to do the claimed analysis. As the record is now clear that the analysis and techniques for the analysis are not a part of, taught by, or suggested by the acknowledged prior art, the disclosure is insufficient.

As set forth above, the examiner in preparing the previous office action assumed that the specification was adequately disclosed because he assumed that the discussion of the prior art in the specification was sufficient, and was intended to be sufficient, to point those in the art to otherwise previously known techniques for analyzing the data, and thus did not make this rejection at that time.

The remarks, as noted above, state that there is in the acknowledged prior art "no teaching or suggestion" how to do the required and claimed analysis. As the acknowledges prior art lacks the sufficient teachings and suggestions, the specification itself must provide the required information. This it does not do. Thus the disclosure is insufficient under 35 USC 112, first paragraph.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toprac et al (US 6,304,999) and the acknowledged prior art in view of Sato et al (US 5,766,360) and Sun (US 5,940,175).

Scatterometry is a known measurement technique in the art; see the instant specification, pages 4-7, see also the use of scatterometry as a measuring technique in a process control systems as shown by Toprac et al.

It is known in the art to provide a measurement station and wafer handling system in conjunction with a process tool to move a wafer being processed to and from the processing tool and measurement station; see Toprac et al, Sato et al and Sun. Toprac et al shows it is known to use scatterometry measurements to control characteristics as line width (column 4, lines 46 and 57) as well as other processes (column 4, line 63-65). Sato teaches that the measurement station can perform "various measurements and inspections" (column 6, line 41-42); although Sato et al explicitly discusses measuring and inspecting a thin film, it would have been obvious to make other known inspections or measurements for other type of processing steps by the inclusion of various other known inspection and

measurement instruments, including the known scatterometry instruments as shown by Toprac et al.. Sun shows a means of accessing any point on the wafer by rotating the wafer and moving the measuring head laterally over the wafer; see figure 4, for example. The use of such a known manner of relatively positioning the measuring head and the wafer with other known measuring systems, such as the known scatterometry systems, would have been obvious. Other known means, such as an x-y stage, for this relative movement would have been obvious. Sun also shows a window can be placed between the measurement system and the wafer support to locate the measurement tool itself outside the process tool environment.

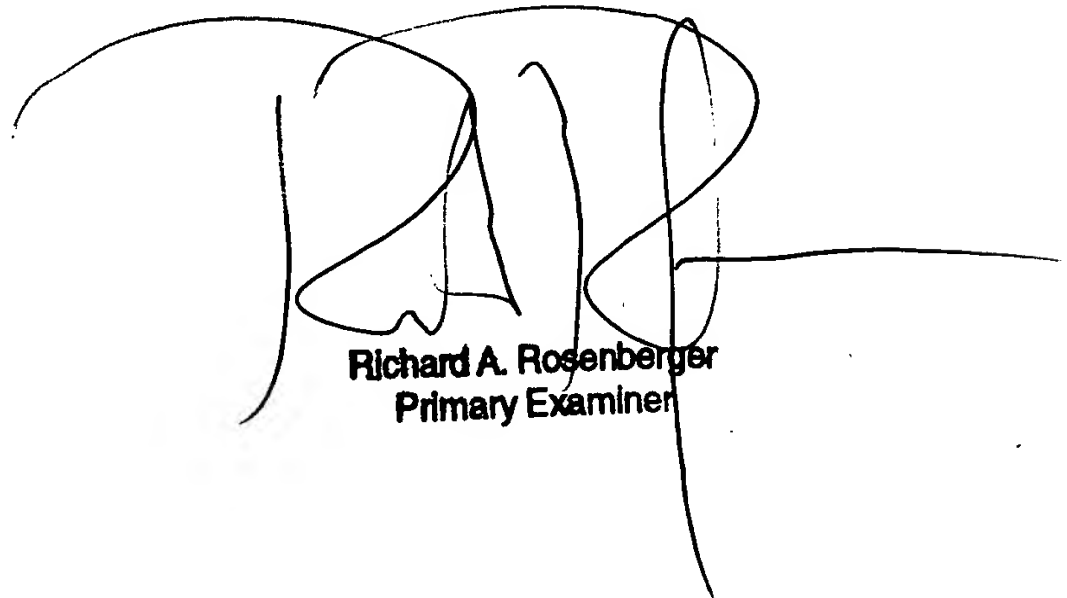
5. The remarks filed argue that the fact that other measuring systems are known as a part of a processing system that it is obvious to use a scatterometry system for process control. This argument is not persuasive as there is no reason for those in the art to assume that a scatterometry system would somehow cease to operate simply because it has been placed into a processing arrangement. There would certainly be every reason to have not only a likelihood, but a certainty, of success, and no experimentation at all would be required to obtain scatterometry data in the known manner of such scatterometry systems. The apparent belief in the remarks that the laws of optics are different in the context of a processing tool as opposed to outside of a processing tool appears to be without merit. See, in addition, Toprac et al.

6. Papers related to this application may be submitted to Group 2800 by facsimile transmission. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The fax number is (703) 872-9306

Any inquiry concerning this communication or earlier communications from the examiner should be directed to R. A. Rosenberger whose telephone number is (571) 272-2428.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

R. A. Rosenberger  
5 March 2004



Richard A. Rosenberger  
Primary Examiner